UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,622	12/09/2003	Michael Kowalchik	EMC-01-102CIP1	4760

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EXAMINER
CHACE, CHRISTIAN

ART UNIT	PAPER NUMBER
2189	

DATE MAILED: 01/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/731,622	KOWALCHIK ET AL.
	Examiner	Art Unit	
	Christian P. Chace	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2005*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *30-32,34-43,45 and 47-50* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *30-32,34-43,45 and 47-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/21/05*.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on

11/21/05 has been entered.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 11/21/05 is in

compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure

statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 30-32, 34-43, 45, and 47-50 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Brant et al (US Patent #5,805,787) in view of Rao (US Patent

#5,845,104).

With respect to independent claim 30, Brant et al disclose a data storage device

is disclosed in figure 1.

A device interface for receiving data access requests is disclosed in figure 1 as #11.

A device housing conforming to a standard form factor is disclosed in column 1,line 42, e.g.

A plurality of non-volatile memory devices housed within the device housing is disclosed in figure 1, #16.

A controller that accesses the non-volatile memory devices in response to the received data access requests is disclosed in figure 1, #20.

The difference between the instant claim and Brant et al is the explicit recitation of the plurality of NV memory devices being selected from the group consisting of flash memory... etc.

Rao discloses the use of Flash memory in column 8, line 33.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, having the teachings of Brant et al and Rao before him/her, to utilize the flash memory of Rao in the system of Brant et al because flash memory has the advantage of good read access time, better write access time than a hard disk, and it preserves the contents after power has been removed, as discussed by Rao in column 8, lines 33-36, e.g.

With respect to claim 31, Brant et al disclose the device interface comprising an interface configured to conform to a protocol is disclosed in column 6, lines 39-44, where the protocol is "SCSI-type connections."

With respect to claim 32, Brant et al disclose the protocol comprising at least one of the following: SCSI, Fibre Channel, and "Infiniband" is disclosed in column 6, lines 39-44, which specifically discloses SCSI.

With respect to claim 49, Brant et al disclose the plurality of non-volatile memory devices including mechanical or "microelectromechanical" is disclosed column 1 as disks.

With respect to claim 35, Brant et al disclose the controller comprising a controller configured to implement or access the more than two disks in a RAID scheme is disclosed in column 5, lines 34, 36, and 44, in general. RAID stands for, "Redundant Array of Independent Disks." In this case, column 5, line 59 recites "Controller 20 can include independent paths to write data to its memory in a mirrored fashion." Mirroring is redundant storage of data. The cache being an array is disclosed in column 4, line 15, for example. Figure 1 clearly shows separate disks, and, therefore, independent disks. Therefore, RAID is explicitly disclosed embodied in the invention of Brant et al.

With respect to claims 36 and 48, Brant et al disclose the scheme implemented by the controller comprising a RAID scheme is disclosed as discussed supra with respect to instant claims 10, 21, and 28. The RAID scheme being independent of a hierarchically higher RAID controller that sends the data storage device data is discussed in column 5, lines 12-35. By stating that the system of Brant et al, which includes RAID, as discussed in the cited passage, that the storage subsystem can fill **several** intermediate slots in the hierarchy, as stated in line 31 of the instant passage, Brant et al anticipates hierarchically higher RAID controllers.

With respect to claim 37, said data storage device further comprising a cache manager is disclosed in figure 1 as #20, and it's operation is further discussed in column 6, line 35, for example.

With respect to claim 38, Brant et al disclose the cache manager comprising a manager configured to perform at least one of the following: translate an address of a different storage device (for example, back-end storage), cache data included in a write request, load data from the different storage device, and remove cached data is disclosed in column 6, line 35, for example. The controller #20 in Brant et al performs the functions of the instantly claimed cache manager as well as the instantly claimed controller of instant claim 1.

However, it happens that all of the following are anticipated by the cited prior art of record, with the instant claim limitations in parenthesis along with the relevant citation in Brant et al:

Requesting data from a back-end storage system (which inherently requires translating the address of that different storage system) (see column 6, lines 50-51);

Retrieving requested data (caching data included in a write request and loading data from the different storage device) from the [at least two] disks [making up the cache] (see column 4, lines 9-19);

Sending data to the back-end system for writing (column 6,lines 50-51);

Determining the location of back-end system data (more address translation) within the [at least two] disks [making up the cache] (column 4, lines 32-48).

Removing data from the [at least two] disks [making up the cache] (removing cached data) (column 4, lines 42-44).

With respect to claim 39, Brant et al disclose a controller card that includes the controller and connections available to couple with more than one storage card that provides access to the [a] the [at] least two of the [disk] drives is disclosed in column 5, lines 41-45, which discloses ASIC based daughter cards which the disclosed products of Brant et al can be based on. These products of Brant et al are what examiner is rejecting the instant claims over, so it logically follows that "these products" apply to the instant claim language.

With respect to claim 40, the storage card comprising a card having at least one parallel interface to a collection of the drives is disclosed column 5, line 30 as well as lines 41-45, for the reasons as discussed supra with respect to claim 15.

With respect to claim 41, Brant et al disclose the connection between the controller and storage card comprising a serial connection is disclosed in column 6, line 41, as "SCSI-type connections." SCSI has a serial as well as a parallel "type" connection, and, therefore, the cited passage anticipates the instant claim language.

With respect to claim 42, the controller comprising a bank interface that routes data requests to the appropriate bank of drives is disclosed in figure 1 as #15, as discussed in column 5, lines 54-56, for example.

With respect to independent claim 43, a data storage system is disclosed in figure 1.

At least one first data storage device having a platter size of at least 3.5 inches in diameter is disclosed in column 5, line 39. The hierarchy listed in column 5, from line 12 to line 28, shows the lower levels of the hierarchy having higher capacity disks. To increase capacity on a disk that uses a standard method of data storage, one must, inherently, increase the physical size, or platter size, of that disk.

A device interface for receiving data access requests is disclosed in figure 1 as #11.

A device housing conforming to a standard form factor is disclosed in column 1,line 42, e.g.

A plurality of non-volatile memory devices housed within the device housing is disclosed in figure 1, #16.

A first controller that accesses the non-volatile memory devices in response to the received data access requests is disclosed in figure 1, #20.

A second controller that "coordinates" data access to the at least one first data storage device and the at least one second data storage device is disclosed in figure 1, #24.

The difference between the instant claim and Brant et al is the explicit recitation of the plurality of NV memory devices being selected from the group consisting of flash memory...etc.

Rao discloses the use of Flash memory in column 8, line 33.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, having the teachings of Brant et al and Rao before him/her, to

utilize the flash memory of Rao in the system of Brant et al because flash memory has

the advantage of good read access time, better write access time than a hard disk, and

it preserves the contents after power has been removed, as discussed by Rao in

column 8, lines 33-36, e.g.

With respect to independent claim 45, a method of servicing data access

requests at a data storage device is disclosed in the abstract, e.g.

Receiving data access requests at a device interface is discussed in column 6,

lines 39-44, for example. The host sends and receives data through interface #11 in

figure 1.

Accessing a plurality of disk drives (figure 1, #22) with a standard from factor

(discussed supra with respect to claim 30, e.g.) in response to the received data access

requests is disclosed in column 6, lines 39-48.

The difference between the instant claim and Brant et al is the explicit recitation

of the plurality of NV memory devices being selected from the group consisting of flash

memory...etc.

Rao discloses the use of Flash memory in column 8, line 33.

Therefore, it would have been obvious to one of ordinary skill in the art at the

time of the invention, having the teachings of Brant et al and Rao before him/her, to

utilize the flash memory of Rao in the system of Brant et al because flash memory has

the advantage of good read access time, better write access time than a hard disk, and

it preserves the contents after power has been removed, as discussed by Rao in

column 8, lines 33-36, e.g.

With respect to independent claim 47, a data storage device is disclosed in figure 1.

A device interface for receiving data access requests is disclosed in figure 1 as #11.

A device housing conforming to a standard form factor is disclosed in column 1,line 42, e.g.

A plurality of non-volatile memory devices housed within the device housing is disclosed in figure 1, #16.

A controller that accesses the non-volatile memory devices in response to the received data access requests is disclosed in figure 1, #20.

The controller comprising a controller configured to implement or access the more than two disks in a RAID scheme is disclosed in column 5, lines 34, 36, and 44, in general. RAID stands for, "Redundant Array of Independent Disks." In this case, column 5, line 59 recites "Controller 20 can include independent paths to write data to its memory in a mirrored fashion." Mirroring is redundant storage of data. The cache being an array is disclosed in column 4, line 15, for example. Figure 1 clearly shows separate disks, and, therefore, independent disks. Therefore, RAID is explicitly disclosed embodied in the invention of Brant et al.

The difference between the instant claim and Brant et al is the explicit recitation of the plurality of NV memory devices being selected from the group consisting of flash memory...etc.

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Therefore, it would have been obvious to one of ordinary skill in the art at the

time of the invention, having the teachings of Brant et al and Rao before him/her, to

utilize the flash memory of Rao in the system of Brant et al because flash memory has

the advantage of good read access time, better write access time than a hard disk, and

it preserves the contents after power has been removed, as discussed by Rao in

column 8, lines 33-36, e.g.

With respect to independent claim 49, the limitations have been discussed and

anticipated supra with respect to claims 30 and 33, e.g.

With respect to independent claim 50, the limitations have been addressed supra

with respect to claim 30 as well. Examiner notes herein that with respect to the instant

claim, examiner interprets the non-volatile memory device to be the disk drive, therefore

inherently "emulating a disk drive access."

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brant et

al and Rao as applied to claim 1, upon which the instant claims depend, above, and

further in view of Eckerd et al (US Patent #6,078,498).

Brant et al and Rao teach the data storage device as claimed in claim 30 of the

instant application.

The difference between Brant et al and Rao and the instant claims are the

explicit recitations of a housing, the housing having one of the following form factors:

standard, half-height, and low-profile.

However, Eckerd et al disclose a top cover cooperating with the base deck to

form an internal, scaled environment for the disc drive in column 3, lines 22-25. This is

a housing. In column 6, lines 18-30, Eckerd et al disclose that housing to be a standardized form factor, including low profile, nominal, and half-height.

Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, having the teachings of Brant et al, Rao, and Eckerd et al before him/her, to utilize the housing and form factors of Eckerd et al in the invention of Brant et al and Rao, because smaller form factor disk drives permit disk subsystems to exploit performance advantages of having more disks to service requests in parallel, as discussed by Brant et al in column 1, lines 42-45, and because the relative configurations of the mounting plate and chassis can vary depending upon requirements of a given application, as discussed in column 5, lines 15-18 of Eckerd et al.

Double Patenting

Claims 30-50 of this application conflict with claims 1-3, 14-16, and 18-20 of

Application No. 10/004,090. 37 CFR 1.78(b) provides that when two or more

applications filed by the same applicant contain conflicting claims, elimination of such

claims from all but one application may be required in the absence of good and

sufficient reason for their retention during pendency in more than one application.

Applicant is required to either cancel the conflicting claims from all but one application

or maintain a clear line of demarcation between the applications. See MPEP § 822.

The nonstatutory double patenting rejection is based on a judicially created
doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the
unjustified or improper timewise extension of the "right to exclude" granted by a patent
and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11
F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225
USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA
1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*,
418 F.2d 528, 163 USPQ 644 (CCPA 1969).
A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be
used to overcome an actual or provisional rejection based on a nonstatutory double
patenting ground provided the conflicting application or patent is shown to be commonly
owned with this application. See 37 CFR 1.130(b).
Effective January 1, 1994, a registered attorney or agent of record may sign a
terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with
37 CFR 3.73(b).

Claims 30-33 and 34-50 are provisionally rejected under the judicially created

doctrine of obviousness-type double patenting as being unpatentable over claims 1-3,

14-16, and 18-20 of copending Application No. 10/004,090. Although the conflicting

claims are not identical, they are not patentably distinct from each other because for

example, "mechanical memory devices" may be interpreted as "disk drives," and it is

notoriously obvious to one of ordinary skill in the art that other types of NV memory may

be used instead of disk drives, e.g., Flash memory, as disclosed by Rao as discussed

supra.

Instant claims 30, 33, 35-36, and 44-50, are anticipated by copending claim 1.

Instant claim 32 is anticipated by copending claim 2.

Instant claims 37-38 are anticipated by copending claim 14.

Instant claim 39 is anticipated by copending claim 15.

Instant claim 40 is anticipated by copending claim 16.

Instant claim 41 is anticipated by copending claim 18.

Instant claim 42 is anticipated by copending claim 19.

Instant claim 43 is anticipated by copending claim 20.

It is noted that "anticipation is the epitome of obviousness."

This is a provisional obviousness-type double patenting rejection because the

conflicting claims have not in fact been patented.

Claim 34 is provisionally rejected under the judicially created doctrine of

obviousness-type double patenting as being unpatentable over claim 9 of copending

Application No. 10/004,090 in view of Eckerd et al (cited supra). The Graham v. Deere

factors are noted supra with respect to the rejection of claim 34, e.g.

This is a provisional obviousness-type double patenting rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Christian P. Chace whose telephone number is

571.272.4190. The examiner can normally be reached on MAXI FLEX.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Donald Sparks can be reached on 571.272.4201. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Christian P. Chace
Primary Examiner
Art Unit 2189

1/9/06